Operating instructions

Digital Output Module for Zone 1

> 9475/32-08-.2

STAHL

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2 General information

2.1 Manufacturer

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2.2 Information regarding the operating instructions

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2.3 Conformity with standards and regulations

Conformity with standards and regulations is specified in the corresponding certificates and the EC Declaration of Conformity. These documents can be downloaded from our homepage www.stahl-ex.com.

3 Symbols used

	Safety notes **Non-compliance can result in material damage, serious injuries or death.** The safety notes contained in these operating instructions and affixed to the device must be observed!
	Warning symbol Danger due to explosive atmosphere!
	Warning symbol Danger due to live components!
☞	**Note** This graphic marks important additional information, tips and recommendations.

4 General safety notes

4.1 Operating instructions storage

Read these operating instructions carefully and store them near the installation place. For correct operation, please observe all other documents enclosed in this delivery and the operating instructions of the equipment to be connected.

4.2 Safety notes

⚠ WARNING	
	Use the devices only for their intended purpose! ▶ We cannot be held liable for damage caused by incorrect or unauthorized use or by non-compliance with these operating instructions. ▶ Use the device only if it is undamaged and clean.

⚠ WARNING	
	Any unauthorized work on the device is prohibited! Installation, maintenance, overhaul and repair may only be carried out by authorized and appropriately trained personnel.

Observe the following information during installation and operation:

- Any damage can invalidate the explosion protection
- National and local safety regulations
- National and local accident prevention regulations
- National and local assembly and installation regulations
- Generally recognized technical regulations
- Safety notes in these operating instructions
- Characteristic values and rated operating conditions on the rating plates and data plates
- Additional information plates on the devices

Additional safety notes:

- The digital output module Type 9475/32-08-.2 is approved for use in gas hazardous areas of Zone 1, Zone 2 and in the safe area.
- The digital output module Type 9475/32-08-.2 is approved for use in dust hazardous areas of Zone 21 and Zone 22.
- For operation in gas or dust hazardous areas, the module must be installed in an enclosure which fulfils the requirements of IEC/EN 60079-0.
- The module must be mounted on the BusRail 9494 only.
- A distance of 50 mm must be maintained between intrinsically safe and non-intrinsically safe electric circuits.
- Modules with intrinsically safe and non-intrinsically safe field circuits may be operated simultaneously on one BusRail. In this case, a distance of 50 mm must be maintained between the terminals of intrinsically safe and non-intrinsically safe electric circuits (e.g. partition 220101 or empty space).
- The safety-related maximum values of the connected field devices must match the values of the modules according to data sheet, operating instructions and EC Type Examination Certificate.
- Interconnections of several active intrinsically safe circuits can result in different safety-related maximum values. This can endanger the intrinsic safety so that an appropriate proof must be provided.
- Modules and plug connectors may be connected and disconnected during operation in hazardous areas (hot-swap und hot-plug).
- To avoid electrostatic charging, the modules in hazardous areas must be cleaned only with a moist cloth.

4.3 Alterations and modifications

⚠ WARNING	
	Alterations and modifications to the device are not permitted. We shall not accept any liability or warranty obligations for damage resulting from alterations and modifications.

4.4 Special versions

In case of additional/different order options, special versions may differ from the description given here.

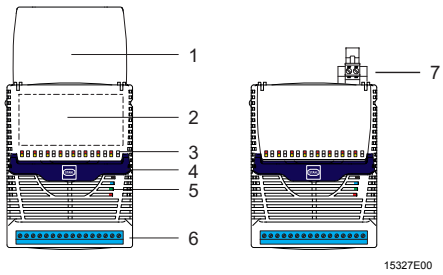
5 Intended use

The digital output module is used for connecting of up to 8 intrinsically safe solenoid valves, indication or signal elements to the IS1 remote I/O system. The additional Ex i control input "Plant STOP" is used for safe switching off all outputs. All channels are individually monitored for wire breakage and short-circuit. The Ex i outputs are short-circuit proof, galvanically connected to each and galvanically separated from the system.

Compatible spare for IS1 I/O modules:
Series 9475/12-08-51, 9475/12-08-61, 9475/22-08-51, 9475/22-08-61

6 Components

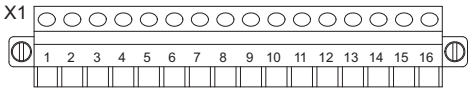
6.1 Overview



1	Operating flap with insert label (open) and connection diagram
2	Module data (serial number, hardware revision number, software revision number, manufacturing date, e.g.: 123456DE9999 Rev.A 01-01 0508)
3	LEDs (red) for error indication (wire breakage/short circuit) for each channel; LEDs (yellow) for status indication (ON/OFF) for each channel and "Plant STOP"
4	Notch lever for removing the module from the BusRail
5	LED for operation indication ("RUN", green), error ("ERR", red) and maintenance ("M/S", blue) (for further information, see "LED indications and troubleshooting")
6	Pluggable terminal X1
7	Pluggable terminal X3 "Plant STOP"

6.2 Pluggable terminals X1 and X3

For the module, a pluggable terminal X1 (screw-type terminal 162702 or spring clamp terminal 162695) for connection of field devices is available as accessory (not included in the scope of delivery of the module!).
The pluggable terminal X1 has 16 terminals for connection of the field cables.
The modules have an additional pluggable terminal X3 for connection to the electric circuit "Plant STOP". The pluggable terminal X3 has 2 terminals. It can be plugged either into X3.1, X3.2 (contact) or X3.3, X3.4 (active input) on the module. It is impossible to plug terminals into 3.1, X3.2 und X3.3, X3.4 simultaneously.



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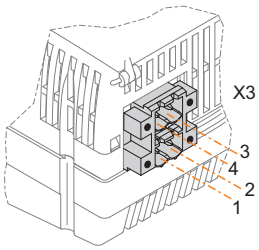

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Terminal assignment

	X1 output signals
Channel	Terminals
0	1(+), 2(-)
1	3(+), 4(-)
2	5(+), 6(-)
3	7(+), 8(-)
4	9(+), 10(-)
5	11(+), 12(-)
6	13(+), 14(-)
7	15(+), 16(-)

	X3 "Plant STOP"
Operating mode	Terminals
Contact	1
	2
Active input	Input 3(+)
	Input 4(-)

NOTICE

☞ "Plant STOP" in the operating mode "Contact" is compatible with module 9475/22. Here, the terminal X3.2 is connected via earth with the X1(-) terminals of the outputs.
Only for connection to passive equipment, such as contacts or optocouplers!
It must be galvanically separated from other intrinsically safe and non-intrinsically safe electric circuits and from the earth and must not be connected to electric circuits "Plant STOP" of other modules.

NOTICE

☞ In the operating mode "Active input" at terminals X3.3 and X3.4, "Plant STOP" is galvanically separated from all other electric circuits and may be connected in parallel to other modules.

7 Technical data

Explosion protection

Global (IECEx)

Gas and dust: IECEx PTB 06.0001X
Ex ib [ia] IIC T4
[Ex iaD]

Europe (ATEX)

Gas and dust: DEKRA 12 ATEX0232X
⟨Ex⟩ II 2 (1) G Ex ib [ia Ga] IIC T4 Gb
⟨Ex⟩ II (1) D [Ex ia Da] IIIC

Certificates and approvals

Certificates: IECEx, ATEX

Further parameters

Installation: in Zone 1, Zone 2, Zone 21, Zone 22 and in the safe area

Safety data

Version: 9475/32-08-52

Max. voltage U_o: 19.4 V

Output ia

Max. current I_o: 143 mA

Max. power P_o: 692 mW

Max. connectable inductance L_o/capacity C_o

IIC	L_o [mH]	1.44	1.4	0.65	0.5	0.2	0.1	0.05
	C_o [nF]	--	103	113	113	153	183	227
IIB / IIIC	L_o [mH]	7.5	5.0	2.0	0.5	0.2	0.1	0.02
	C_o [nF]	673	883	943	943	1083	1283	1493

Output ib

Max. current I_o: 37.8 mA

Max. power P_o: 506 mW

Max. connectable inductance L_o/capacity C_o

IIC	L_o [mH]	6.3	2.0	0.65	0.5	0.2	0.1	0.05
	C_o [nF]	113	113	123	123	153	193	227
IIB / IIIC	L_o [mH]	58	20	10	5.0	0.2	0.1	0.02
	C_o [nF]	363	723	953	963	1083	1283	1493

Max. internal capacity C_i: 16.5 nF (in the above tables, C_i is subtracted from C_o)

Max. internal inductance L_i: negligible

Version: 9475/32-08-62

Max. voltage U_o: 25.7 V

Output ia

Max. current I_o: 107 mA

Max. power P_o: 688 mW

Max. connectable inductance L_o/capacity C_o

IIC	L_o [mH]	1.57	1.1	1.0	0.9	0.5	0.2	0.1
	C_o [nF]	--	49	52	54	69	95	97
IIB / IIIC	L_o [mH]	11	5.0	1.0	0.5	0.2	0.1	0.05
	C_o [nF]	335	335	395	485	635	785	785

Output ib

Max. current I_o: 26.3 mA

Max. power P_o: 468 mW

Max. connectable inductance L_o/capacity C_o

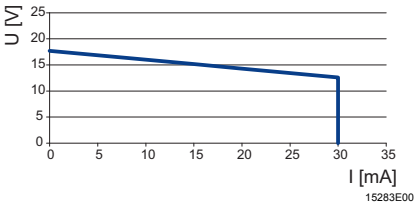
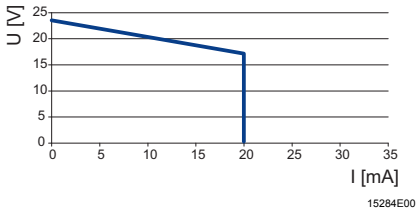
IIC	L_o [mH]	7.0	5.0	2.0	1.0	0.5	0.2	0.05
	C_o [nF]	32	36	49	64	81	97	97
IIB / IIIC	L_o [mH]	100	50	1.0	0.5	0.2	0.1	0.05
	C_o [nF]	245	365	425	505	655	785	785

Max. internal capacity C_i	5.2 nF (in the above tables, C_i is subtracted from C_o)
Max. internal inductance L_i	negligible

Ex i control input "Pant STOP"

Connection terminals	X3 1, 2 (without galvanic separation, 9475/22 compatible)	X3 3, 4 (with galvanic separation, switchable in parallel)
Type of protection	Ex ia	Ex ia
Max. voltage U_o	5.1 V	--
Max. current I_o	0.44 mA	--
Max. power P_o	0.5 mW	--
Max. connectable inductance L_o/capacity C_o		
IIC	L_O [mH] 100 | 10 | 2 | 1 | 0.2 | 0.01 C_O [µF] 2.195 | 2.595 | 3.295 | 3.695 | 5.495 | 15.995	--
IIB / IIIC	L_O [mH] 100 | 10 | 2 | 1 | 0.2 | 0.01 C_O [µF] 9.995 | 12.995 | 16.995 | 19.995 | 31.995 | 159.995	--
Max. voltage U_i	--	30 V
Max. internal resistance R_i	--	4940 Ω
Max. internal capacity C_i	5.2 nF (in the above tables, C_i is subtracted from C_o)	negligible
Max. internal inductance L_i	negligible	negligible

Electrical data

Version	**9475/32-08-52**	**9475/32-08-62**
Ex i outputs		
Number of channels	8	8
Open-circuit voltage	17.5 V	23.5 V
Output nominal current	30 mA	20 mA
Internal resistance	170 Ω	315 Ω
Rated operation		
U	12.6 V	17.5 V
I	30 mA	20 mA
Output characteristic		

Ex i control input X3

Function	"Plant STOP" to switch off all outputs
Suitability	Switch-off up to SIL 2 (IEC61508)

Connection terminals	X3 1, 2 (without galvanic separation, 9475/22 compatible)	X3 3, 4 (with galvanic separation, switchable in parallel)
Supply voltage	3.3 V	--
Internal resistance	20.5 kΩ	--
Control voltage for all outputs		
„OFF“ („Plant-STOP“ activated)	> 2.2 V	< 1 V
„Normal operation“ („Plant-STOP“ deactivated)	< 0.7 V	> 6 V

Galvanic separation

Test voltage	
acc. to standard	EN 60079-11
Between auxiliary power/ system components	≥ 1500 V AC
Between two I/O modules	≥ 500 V AC

Between I/O channels/ system components	≥ 500 V AC	
Between I/O channels/ ground (PA)	≥ 500 V AC	
Between I/O channels/ "Plant STOP" (X3 3, 4)	≥ 500 V AC	
Between "Plant STOP" (X3 3, 4)/earth (PA)	≥ 500 V AC	
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 (2006) IEC 61000-4-1 … 6, NAMUR NE 21	
Electrical connection		
Power supply	BusRail Types 9494	
Ex i field signals	Pluggable, blue terminals, 16-pole, 2.5 mm^2, screw- or spring-type versions with lock	
Ex i control input	Pluggable, blue terminal, 2-pole, 2.5 mm^2, screw type version with lock	
Auxiliary power		
Version	Intrinsically safe Ex ia via BusRail	
Behaviour during undervoltage	all outputs "OFF"	
Max. current consumption	250 mA	240 mA
Max. power consumption	6 W	5.8 W
Max. power dissipation	4.8 W	4 W
Device-specific data		
Settings		
Module		
Diagnosis messages	ON / OFF	
Signal		
Line fault monitoring	ON / ON without test current / OFF	
Behaviour in case of error	ON / OFF / hold last value	
Ambient conditions		
Ambient temperature	-40 … +75 °C	
Storage temperature	-40 … +80 °C	
Maximum relative humidity	95 % (without condensation)	
Semi-sinusoidal shock (IEC EN 60068-2-27)	15 g (3 shocks per axis and direction)	
Sinusoidal vibration (IEC EN 60068-2-6)	1 g in the frequency range 10 ... 500 Hz 2 g in the frequency range 45 ... 100 Hz	
Mechanical data		
Degree of protection (IEC 60529)	IP20	
Module enclosure	polyamide 6GF	
Fire resistance (UL 94)	V2	
Pollutant class	corresponds to G3	
Dimensions	L = 128 mm, W = 96.5 mm, H = 67 mm	
Indication		

LED indication	
Module requires maintenance	LED "M/S", blue
Operating state	LED "RUN", green
Group error	LED "ERR", red
Channel error	LED red, for each channel
Channel status	LED yellow, for each channel
"Plant STOP"	LED yellow ("Plant STOP" active, all outputs are high-impedance)
Function indication	
Retrievable parameters	Manufacturer, Type, hardware revision, software revision, serial number
Error indication	
Module status and alarms	• Internal bus error primer / redundant • No response from IOM • Configuration does not correspond to module • Hardware error • Excess temperature • Slot error • Module requires maintenance
Signal errors for each channel	
Signal status bit	"0" = output high-impedance / "1" = output is supplied
Wire breakage output	> 12 kΩ (with deactivated test current can be detected only if the output is switched on)
Short circuit output	< 30 Ω (response range 30 ... 60 Ω) (can be detected only if the output is switched on)
Mounting / installation	
Mounting orientation	horizontal or vertical (see chapter 9.3)
Mounting type	on 35 mm DIN rail LV 35/15 (DIN EN 60715)

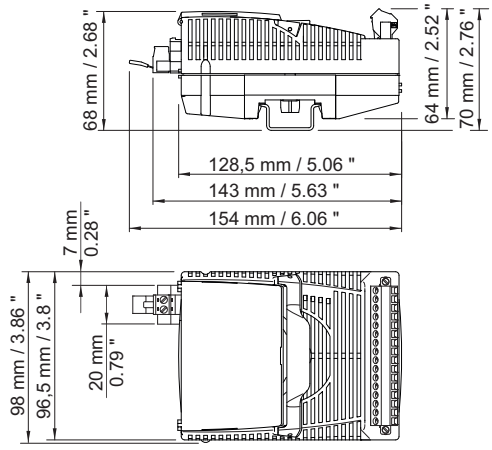
8 Transport and storage

- Transport and storage are only permitted in the original packaging.
- The devices must be stored in a dry place and vibration-free.

9 Installation

9.1 Dimensions / fastening dimensions

Dimensional drawings (all dimensions in mm / inches) - subject to modifications



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9.2 Installation conditions

⚠ WARNING	
	The national installation instructions (e.g. IEC/EN 60079-14) must be observed. Ensure that there is a distance of at least 50 mm (safety distance) between connecting units of intrinsically safe and non-intrinsically safe circuits!

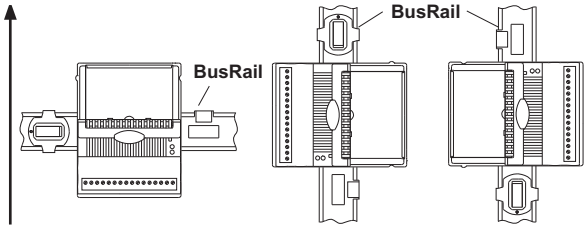
⚠ WARNING	
	If the installation has strong electromagnetic sources of interference, use of shielded field cables is recommended. In this case, the shield must be connected to the equipotential bonding of the hazardous area! For this purpose, the shields of the field wiring must be connected to the shield busses installed in the enclosure as close to the entry point as possible! The shield busses must be also connected to the mounting plate close to the entry point of the field wiring using the shortest possible way!

9.3 Mounting and operating position

Mounting the module on BusRail

NOTICE	
☞	The module and the pluggable terminals X1 and X3 can be safely connected or disconnected during operation in the hazardous area (hot swap).

NOTICE	
☞	Module operation is permitted only in the following mounting positions: Vertical mounting with pluggable terminals below, on the left or right.



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- ▶ Position the module vertically on the provided slot of the BusRail
- ▶ Snap module into place by slightly pressing it

Connecting field devices to the module

NOTICE	
☞	The mounting can be carried out with connected or disconnected terminals. In the operating flap, there is a insert label which can be used for entering the assignment of the field devices to the channels. Labelling of the insert label can be performed, for example by means of the IS Wizard.

- ▶ Connect field devices to terminal X1 according to terminal assignment (see on the front or on insert label under the operating flap) (tightening torque for screw-type terminals 0.5 ... 0.6 Nm)
- ▶ Place the field wiring shields (if present) as close to the entry point on the grounding rail as possible
- ▶ Plug the pluggable terminal X1 into the module and secure it against loosening using safety screws (tightening torque 0.5 ... 0.6 Nm)
- ▶ Mount partition if necessary (distance between intrinsically safe and non-intrinsically safe electric circuits at least 50 mm)

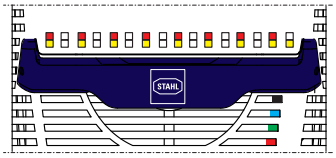
Connecting the "Plant STOP" to the module

NOTICE	
☞	The mounting can be carried out with connected or disconnected terminals. In the operating flap, there is a insert label which can be used for entering the assignment of the field devices to the channels. Labelling of the insert label can be performed, for example by means of the IS Wizard.

- ▶ Connect terminal X3 according to terminal assignment (see on the front or on insert label under the operating flap) (tightening torque for screw-type terminals 0.5 ... 0.6 Nm)
- ▶ If necessary, connect electric circuit "Plant STOP" to the pluggable terminal X3

9.4 LED indications and troubleshooting

Meaning of the LEDs



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- ▶ LED "RUN", green = operation indication
- ▶ LED "ERR", red = module error indication
- ▶ LED "M/S", blue = requires maintenance or outside specification
- ▶ 8 x LED, red = error in the respective field circuit
- ▶ 8 + 1 x LED, yellow = signal state indication (plus state "Plant STOP")

Indication overview

	Module state	Error source	Possible solution
LED "RUN", green			
ON	Normal operation	--	--
FLASHES	In standby (switched on but no data exchange with master yet)	The module is in proper condition but is not ready for cyclic data exchange yet (there is no parameter set available yet). Outputs in a state without power.	• Activate the cyclic data transfer with the master • Check master, bus connection and CPM
OFF	No function	No supply voltage at the I/O module or I/O module is defective.	• Check system supply • Check CPM or CPU&PM • Check the BusRail • Engage the I/O module correctly on the BusRail • Replace the I/O module
LED "ERR", red			
OFF	No error	--	--

	Module state	Error source	Possible solution
FLASHES	External error	Error in the field circuit: wire breakage, short circuit	• Check signal LEDs "red" • Eliminate the cause in the indicated field circuit, check electric lines and field device
	Incorrectly configured module	Configuration is not correct or a wrong module is connected	• Change configuration in the automation system or connect the correct module
	Outputs in safety position	Cyclic data transfer with the automation system has been interrupted	• Check the cyclic data transfer of CPM or CPU (LCD or LED "RUN") • Check bus connection • Activate the cyclic data transfer with the automation system
	Outputs safety disconnected	"Plant STOP" at terminal X3 activated	• Check LED "Plant STOP" • Check connection X3 and deactivate it if necessary
ON	Module error	Module is defective	• Replace the module
LED "M/S", blue			
OFF	Normal operation	--	--
FLASHES	External maintenance required	Ambient temperature is outside the specification	• Reduce ambient temperature by means of, e.g. shading or cooling **Note: If the problem is not eliminated, the module will be permanently damaged**
ON	Maintenance required	Slot error or module is damaged by excess temperature or end of the service life reached	• Replace the module as soon as possible within the next 12 months, otherwise there is a risk of module failure
8 x LED, red			
OFF	Normal operation	--	--
FLASHES	Signal error	Line breakage or short circuit	• Eliminate the cause in the indicated field circuit, check electric lines and field device **Note: "Short circuit" and "Line breakage with deactivated test current" can be detected only if the output is switched on.**
8 + 1 x LED, yellow			
OFF	No output signal (high-impedance)	--	--
ON	Output signal present	--	--
ON (LED "Plant STOP")	All outputs OFF	"Plant STOP" activated	• Deactivate "Plant STOP" at terminal X3

9.5 Dismounting / replacement of the module

⚠ WARNING

If a partition is mounted, first pull out terminals X1 and X3 from the module to be replaced.

NOTICE

☞ When replacing the module by a module identical in construction, the set parameters are maintained. No further user adjustments are necessary. When replacing the module by a module with a different function, the module reports a configuration error (red LED "ERR" flashes). The module must be either re-parameterised or it is necessary to use a module of the correct type.

NOTICE	
☞	If an IS1 module is replaced by an IS1+ module with the same functions, the IS1+ module functions in the compatibility mode (= identical functionality). If new IS1+ functions must be used, it may be necessary to update the software of CPM 9440 or CPU 9441. In case of PROFIBUS DP operation, a new GSD may be required. If required, contact your responsible distributor for further information.

- ▶ Loosen safety screws of the pluggable terminal X1
- ▶ If necessary, loosen the screws of the pluggable terminal X3
- ▶ Pull out the terminals from the module
- ▶ If necessary, remove the partition
- ▶ Pull the blue notch lever of the module upwards to unlock the module
- ▶ Remove the module vertically from the BusRail
- ▶ Position the new module vertically onto the BusRail and snap into place by slightly pressing it
- ▶ If necessary, snap partition into place between modules
- ▶ Plug the pluggable terminal X1 into the module and secure it against loosening using screws (tightening torque 0.5 ... 0.6 Nm)
- ▶ If necessary, plug the pluggable terminal X3 into the module and secure it against loosening using screws (tightening torque 0.5 ... 0.6 Nm)

10 Maintenance, overhaul and repair

10.1 Maintenance

The module does not require regular maintenance.

- ▶ Observe the function according to the intended use
- ▶ Follow the directives according to IEC/EN 60079-17
- ▶ Adhere to permissible temperatures according to IEC/EN 60079-0

NOTICE	
☞	If the blue LED "M/S" lights up continuously, it is recommended to replace the module in the foreseeable future. Otherwise there is a high probability that the module will fail in 12 months (see "LED indications and troubleshooting").

10.2 Repair instructions

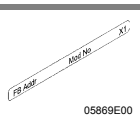
NOTICE	
☞	Repair must be performed by the manufacturer only! When repair is required, send the module to your responsible sales organization (for the address, see chapter 2.1).

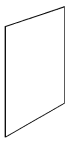
11 Disposal

▶ Observe the national waste disposal regulations.

12 Accessories and spare parts

⚠ WARNING	
EX	**Explosion hazard due to wrong or insufficient spare parts or wrong accessories!** For components with relevant Ex protection, use only suitable, certified spare parts or corresponding accessories of R. STAHL Schaltgeräte GmbH or other manufacturers. Otherwise, explosion protection cannot be guaranteed any longer. R. STAHL Schaltgeräte GmbH cannot be held liable for damage caused by ignoring this danger.

Designation	Figure	Description	Art. no.	Weight kg
Plug-in terminal	02079E00	2.5 mm^2 with lock, 16-pole, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Labelling: 1 ... 16	162702	0.028
	02077E00	2.5 mm^2 with lock, 16-pole, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks Labelling: 1 ... 16	162695	0.028
mA - Isolating Repeater	10389E00	The mA isolating repeaters are used for the connection of 4-wire transmitters to active 2-wire inputs and for the galvanic separation. Input: sink, Ex e Output: sink, Ex i	160166	0.107
	04653E00	The mA isolating repeaters are used for the connection of 4-wire transmitters to active 2-wire inputs and for the galvanic separation. Input: sink, Ex i Output: sink, Ex i	160165	0.075
Labelling strips	 05869E00	"FB Addr ... Mod No ..." for pluggable terminal, sheet with 26 strips	162788	0.001

Designation	Figure	Description	Art. no.	Weight kg
DIN A4 sheet	 09900E00	For label plate on I/O modules; 6 labels on each sheet; print-out using IS Wizard; packaging unit = 20 sheets	162832	0.001
Partition	15196E00	For mounting between intrinsically safe and non-intrinsically safe connections of the I/O modules, in order to adhere to the required 50 mm distance	220101	0.000
Warning sign	05872E00	"Clean modules only with a damp cloth."	162796	0.001

EG-Konformitätserklärung
EC Declaration of Conformity
Déclaration de Conformité CE

R. STAHL Schaltgeräte GmbH • Am Bahnhof 30 • 74638 Waldenburg, Germany
erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt: *that the product:* *que le produit:*	**Digital Output Modul** *Digital Output Module* *Module de sortie numérique*
Typ(en), *type(s), type(s):*	**9475/32-04-e2 (e = 1, 2)**

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) *Directive(s)* *Directive(s)*	Norm(en) *Standard(s)* *Norme(s)*
94/9/EG: **ATEX-Richtlinie** *94/9/EC: ATEX Directive* *94/9/CE: Directive ATEX*	EN 60079-0: 2012 EN 60079-11: 2012 EN 60079-15: 2010
Kennzeichnung, *marking, marquage:*	**Ⓔx II 2 (1) G Ex ia [ia Ga] IIC T4 Gb** **II (1) D [Ex ia Da] IIIC** **CE 0158**
EG-Baumusterprüfbescheinigung: *EC Type Examination Certificate:* *Attestation d'examen CE de type:*	**DEKRA 12 ATEX 0232 X** (DEKRA Certification B.V., Utrechtseweg 310, 6812 AR Arnhem, The Netherlands)
2004/108/EG: EMV-Richtlinie *2004/108/EC: EMC Directive* *2004/108/CE: Directive CEM*	EN 61326-1: 2006
Sonstige Normen: *Other Standards:* *Autres normes:*	EN 50178: 1997 EN 61010-1: 2010

Waldenburg, 11.06.2013

Ort und Datum
Place and date
Lieu et date

i.V.

C. Brenner
Leiter Entwicklung Automatisierung
Director R&D Automation
Directeur R&D Automation

i.V.

J.-P. Rückgauer
Leiter Qualitätsmanagement
Director Quality Management
Directeur Assurance de Qualité

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Nonhazardous
Class I, II, III, Division 1, Group A-G
or Class I, Zone 1, Group IIC/IIB
Hazardous (Classified) Locations

FM approved
Intrinsically safe solenoid valves,
indicating lamps

The Type 9475 Digital Output Module is designed to receive a digital signal from the IS1 CPU & Power Module and output a corresponding discrete signal to solenoid valves, LED initiators and audible alarms. The module is intrinsically safe for installation in a Class I, II, III, Division 1, Group A-G or Class I, Zone 1, Group IIC/IIB hazardous location according to NEC Article 504/505 and provides intrinsically safe connections for Class I, Division 1, Groups A-G or Class I, Zone 0, Group IIC/IIB hazardous locations.

Entity parameters for wiring configuration to the left are as follows:

CL I,II,III, DIV 1, Group A-G or CL I, Zone 1, Group IIC

	V_{OC} [V]	I_{SC} [mA]	P_O [mW]	C_O [nF]	L_O [mH]
9475/*2-04-11	19.9	60	714	220	1.3
9475/*2-04-21	26.2	60	722	94	1.45
9475/*2-04-31	26.2	60	585	94	2.44
9475/*2-08-41	11.5	50	216	1640	6.7
9475/*2-08-51	19.9	38	558	220	1.44
9475/*2-08-61	26.2	30	565	94	1.57

CL I,II,III, DIV 1, Group A-G or CL I, Zone 0, Group IIC

	V_{OC} [V]	I_{SC} [mA]	P_O [mW]	C_O [nF]	L_O [mH]
9475/*2-04-11	19.9	150	742	220	1.3
9475/*2-04-21	26.2	110	722	94	1.45
9475/*2-04-31	26.2	90	585	94	2.44
9475/*2-08-41	11.5	75	216	1640	6.7
9475/*2-08-51	19.9	145	719	220	1.44
9475/*2-08-61	26.2	107	697	94	1.57

"Plant-stop" at 9475/22-0*-*1 only
CL I,II,III, DIV 1, Group A-G or CL I, Zone 1, Group IIC

	V_{OC} [V]	I_{SC} [mA]	P_O [mW]	C_O [µF]	L_O [mH]
9475/22-0*-*1	6.6	67	110	22	8.24

Wiring legend

Connection allocation – Digital Output Module (8 channels)
Type 9475/**-08-**

Channel no.	Function	Connection X1 Terminal no.
0	Output (+)	1
0	Output (-)	2
1	Output (+)	3
1	Output (-)	4
...	...	...
7	Output (+)	15
7	Output (-)	16

Connection allocation – Digital Output Module (4 channels)
Type 9475/**-04-**

Channel no.	Function	Connection X1 Terminal no.
0	Output (+)	1
0	Output (-)	2
1	Output (+)	5
1	Output (-)	6
2	Output (+)	9
2	Output (-)	10
3	Output (+)	13
3	Output (-)	14

Notes:

1. Intrinsically safe apparatus shall be LEDs or an FM approved System or Entity device connected in accordance with the manufacturer´s installation instructions.
2. For Entity concept use the appropriate parameters from above to ensure the following:
   V_{OC} or $V_t \leq V_{max}$ $\quad C_a \geq C_i + C_{leads}$
   I_{SC} or $I_t \leq I_{max}$ $\quad L_a \geq L_i + L_{leads}$
3. Capacitance and Inductance values for circuit with concentrated inductors and capacitors for each type 9475 are on sheet 17 and 18.
4. Suitable separation must be maintained between wiring of each I.S. input channel.
5. General Notes (see Page 1)

WARNING: Substitution of components may impair Intrinsic Safety.
AVERTISSEMENT: Substitution de composants peut compromettre la sécurité intrinsèque.

The safety relevant statements of this document may be transferred into the operating instructions.
Transferring the text, editorial changes of equivalent meaning are allowed.

			2013	Date	Name	Certification drawing	Scale
			drawn	08.02.	Reistle	**Digital Output Module Type 9475/a2-0*-*1 (a = 1 or 2)**	none
			checked		Kaiser		Sheet 16 of 32
02	26.02.2014	Bagusch			STAHL	9400 6 031 001 1	Agency FM
01	22.01.2014	Bagusch					
Version	Date	Name				Ers. f. / Ers. d.	A4

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Type 9475/*2-04-11 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		5.0	830
1.1	100	2.0	840
1.0	100	1.0	840
0.5	120	0.5	850
0.2	150	0.2	1000
0.1	190	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/*2-04-21 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		10.0	290
		5.0	290
		2.0	320
0.74	58	1.0	380
0.5	68	0.5	460
≤ 0.2	94	0.2	610
		≤ 0.1	747

Type 9475/*2-04-31 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		16.0	310
		10.0	310
		5.0	310
2.1	41	2.0	340
1.0	56	1.0	390
0.5	73	0.5	470
≤ 0.2	94	0.2	620
		≤ 0.1	747

Type 9475/*2-08-41 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		20.0	1700
7.8	290	10.0	2200
5.0	400	5.0	2700
2.0	580	2.0	3500
1.0	730	1.0	4300
0.5	900	0.5	5200
0.2	1200	0.2	6700
0.1	1400	0.1	8200
≤ 0.05	1637	≤ 0.05	11200

Type 9475/*2-08-51 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		7.1	670
		5.0	840
1.2	100	2.0	840
1.0	100	1.0	840
0.5	120	0.5	860
0.2	150	0.2	1000
0.1	190	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/*2-08-61 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 0, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 0, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		10.0	300
		5.0	300
		2.0	320
0.89	55	1.0	380
0.5	69	0.5	460
≤ 0.2	94	0.2	610
		≤ 0.1	747

F 4830 503 G

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The safety relevant statements of this document may be transferred into the operating instructions.
Transferring the text, editorial changes of equivalent meaning are allowed.

			2013	Date	Name	Certification drawing	Scale
			drawn	08.02.	Reistle	**Digital Output Module** **Type 9475/a2-0*-*1 (a = 1 or 2)** **(continued from sheet 16)**	none
			checked		Kaiser		Sheet 17 of 32
					STAHL	9400 6 031 001 1	Agency FM
02	26.02.2014	Bagusch					
01	22.01.2014	Bagusch					
Version	Date	Name				Ers. f. / Ers. d.	A4

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Type 9475/*2-04-11 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		5.0	840
2.0	100	2.0	840
1.0	100	1.0	840
0.5	120	0.5	860
0.2	150	0.2	1000
0.1	190	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/*2-04-21 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		10.0	300
		5.0	300
		2.0	320
0.86	55	1.0	380
0.5	69	0.5	460
≤ 0.2	94	0.2	610
		≤ 0.1	747

Type 9475/*2-04-31 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		20.0	320
		10.0	320
2.4	39	5.0	320
2.0	42	2.0	340
1.0	57	1.0	390
0.5	73	0.5	470
≤ 0.2	94	0.2	620
		≤ 0.1	747

Type 9475/*2-08-41 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		20.0	1800
10.0	300	10.0	2300
5.0	440	5.0	2800
2.0	610	2.0	3600
1.0	760	1.0	4300
0.5	920	0.5	5200
0.2	1200	0.2	6700
0.1	1400	0.1	8200
≤ 0.05	1637	≤ 0.05	11200

Type 9475/*2-08-51 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB/IIIC	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		10.0	860
		5.0	860
2.0	110	2.0	860
1.0	110	1.0	860
0.5	120	0.5	870
0.2	160	0.2	1000
0.1	200	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/*2-08-61 Capacitance and Inductance values

CL I, DIV 1, Group A,B CL I, Zone 1, Group IIC		CL I, DIV 1, Group C-G CL I, Zone 1, Group IIB	
L_o [mH]	C_o [nF]	L_o [mH]	C_o [nF]
		10.0	320
		5.0	320
2.0	47	2.0	340
1.0	62	1.0	400
0.5	79	0.5	490
≤ 0.2	94	0.2	630
		≤ 0.1	747

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The safety relevant statements of this document may be transferred into the operating instructions.
Transferring the text, editorial changes of equivalent meaning are allowed.

			2013	Date	Name	Certification drawing	Scale
			drawn	08.02.	Reistle	**Digital Output Module** **Type 9475/a2-0*-*1 (a = 1 or 2)** **(continued from sheet 17)**	none
			checked		Kaiser		Sheet 18 of 32
					STAHL	9400 6 031 001 1	Agency FM
02	26.02.2014	Bagusch					
01	22.01.2014	Bagusch					
Version	Date	Name				Ers. f. / Ers. d.	A4

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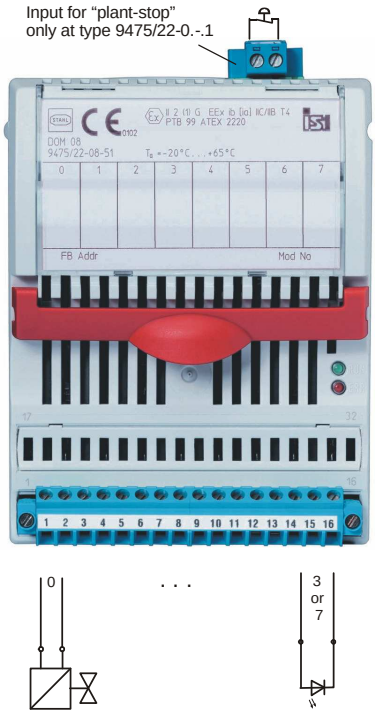
Class I, Zone 1, Group IIC/IIB or
Class I, Div. 2, Groups A, B, C, D
Hazardous (Classified) Locations



Intrinsically safe solenoid valves,
indicating lamps

The Type 9475 Digital Output Module is designed to receive a binary signal from the IS1 9440 CPU & Power Module and output a corresponding discrete signal to solenoid valves, LED initiators and audible alarms. The module is intrinsically safe for installation in a Class I, Zone 1, Group IIC/IIB or Class I, Div. 2, Groups A, B, C, D hazardous locations in accordance with Appendix F of the Canadian Electrical Code, Part I and provides intrinsically safe connections for Class I, Div. 1, Groups A-G or Class I, Zone 0, Group IIC/IIB hazardous locations.

Entity parameters (per channel) for wiring configuration to the left are as follows:

Class I,II,III, Div. 1, Group A-G or Class I, Zone 1, Group IIC

	U_o, V_{oc} [V]	I_{sc}, I_o [mA]	P_o [mW]	C_o, C_a [nF]	L_o, L_a [mH]
9475/.2-04-11	19.9	60	714	220	1.3
9475/.2-04-21	26.2	60	722	94	1.45
9475/.2-04-31	26.2	60	585	94	2.44
9475/.2-08-41	11.5	50	216	1640	6.7
9475/.2-08-51	19.9	38	558	220	1.44
9475/.2-08-61	26.2	30	565	94	1.57

Class I,II,III, Div. 1, Group A-G or Class I, Zone 0, Group IIC

	U_o, V_{oc} [V]	I_{sc}, I_o [mA]	P_o [mW]	C_o, C_a [nF]	L_o, L_a [mH]
9475/.2-04-11	19.9	150	742	220	1.3
9475/.2-04-21	26.2	110	722	94	1.45
9475/.2-04-31	26.2	90	585	94	2.44
9475/.2-08-41	11.5	75	216	1640	6.7
9475/.2-08-51	19.9	145	719	220	1.44
9475/.2-08-61	26.2	107	697	94	1.57

“Plant-stop” at 9475/22-0.-.1 only
Class I,II,III, Div. 1, Group A-G or Class I, Zone 1, Group IIC

	U_o, V_{oc} [V]	I_{sc}, I_o [mA]	P_o [mW]	C_o, C_a [µF]	L_o, L_a [mH]
9475/22-0.-.1	6.6	67	110	22	8.24

Wiring legend
Connection allocation – Digital Output Module (8 channels)
Type 9475/..-08-..

Channel no.	Function	Connection X1 Terminal no.
0	Output (+)	1
0	Output (-)	2
1	Output (+)	3
1	Output (-)	4
…	…	…
7	Output (+)	15
7	Output (-)	16

Connection allocation – Digital Output Module (4 channels)
Type 9475/..-04-..

Channel no.	Function	Connection X1 Terminal no.
0	Output (+)	1
0	Output (-)	2
1	Output (+)	5
1	Output (-)	6
2	Output (+)	9
2	Output (-)	10
3	Output (+)	13
3	Output (-)	14

Notes:

1.) Intrinsically safe apparatus shall be LEDs or a CSA Certified Entity device connected in accordance with the manufacturer´s installation instructions.

2.) For Entity concept use the appropriate parameters from above to ensure the following:

U_o, V_{oc} ≤ U_i or V_{max} C_o, C_a ≥ C_i + C_{leads}
I_o, I_{sc} ≤ I_i or I_{max} L_o, L_a ≥ L_i + L_{leads}

3.) Suitable separation must be maintained between wiring of each I.S. input channel.

4.) For Division 1 applications, either the Zone 0 or Zone 1 parameters may be used.

5.) Capacitance and Inductance values for circuit with concentrated inductors and capacitors for each type 9475 are on sheet 9 and 10.

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Index	Date	Name
B	17.08.09	Einsiedler
A	10 / 2004	T. Stahl

F 4830 503

	Date	Name
2004		
Drawn by	April	Toby
Checked		Faulring

STAHL

Certification drawing

Digital Output Module
Type 9475

94 006 01 31 2

Rep. f. | Rep. t.

Scale: none
Sheet: 8 of 14
Agency: CSA
A4

Type 9475/.2-04-11 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 0, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 0, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		5.0	830
1.1	100	2.0	840
1.0	100	1.0	840
0.5	120	0.5	850
0.2	150	0.2	1000
0.1	190	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/.2-04-21 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 0, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 0, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		10.0	290
		5.0	290
		2.0	320
0.74	58	1.0	380
0.5	68	0.5	460
≤ 0.2	94	0.2	610
		≤ 0.1	747

Type 9475/.2-04-31 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 0, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 0, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		16.0	310
		10.0	310
		5.0	310
2.1	41	2.0	340
1.0	56	1.0	390
0.5	73	0.5	470
≤ 0.2	94	0.2	620
		≤ 0.1	747

Type 9475/.2-08-41 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 0, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 0, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		20.0	1700
7.8	290	10.0	2200
5.0	400	5.0	2700
2.0	580	2.0	3500
1.0	730	1.0	4300
0.5	900	0.5	5200
0.2	1200	0.2	6700
0.1	1400	0.1	8200
≤ 0.05	1637	≤ 0.05	11200

Type 9475/.2-08-51 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 0, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 0, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		7.1	670
		5.0	840
1.2	100	2.0	840
1.0	100	1.0	840
0.5	120	0.5	860
0.2	150	0.2	1000
0.1	190	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/.2-08-61 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 0, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 0, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		10.0	300
		5.0	300
		2.0	320
0.89	55	1.0	380
0.5	69	0.5	460
≤ 0.2	94	0.2	610
		≤ 0.1	747

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			2004	Date	Name	Certification drawing **Digital Output Module Type 9475** **(continued from sheet 8)**	Scale: none
			Drawn by	April	Toby		Sheet: 9 of 14
			Checked		Faulring		
B	17.08.09	Einsiedler				94 006 01 31 2	Agency: CSA
A	10 / 2004	T. Stahl					
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Type 9475/.2-04-11 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 1, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 1, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		5.0	840
2.0	100	2.0	840
1.0	100	1.0	840
0.5	120	0.5	860
0.2	150	0.2	1000
0.1	190	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/.2-04-21 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 1, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 1, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		10.0	300
		5.0	300
		2.0	320
0.86	55	1.0	380
0.5	69	0.5	460
≤ 0.2	94	0.2	610
		≤ 0.1	747

Type 9475/.2-04-31 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 1, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 1, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		20.0	320
		10.0	320
2.4	39	5.0	320
2.0	42	2.0	340
1.0	57	1.0	390
0.5	73	0.5	470
≤ 0.2	94	0.2	620
		≤ 0.1	747

Type 9475/.2-08-41 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 1, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 1, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		20.0	1800
10.0	300	10.0	2300
5.0	440	5.0	2800
2.0	610	2.0	3600
1.0	760	1.0	4300
0.5	920	0.5	5200
0.2	1200	0.2	6700
0.1	1400	0.1	8200
≤ 0.05	1637	≤ 0.05	11200

Type 9475/.2-08-51 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 1, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 1, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		10.0	860
		5.0	860
2.0	110	2.0	860
1.0	110	1.0	860
0.5	120	0.5	870
0.2	160	0.2	1000
0.1	200	0.1	1200
≤ 0.05	220	≤ 0.05	1417

Type 9475/.2-08-61 Capacitance and Inductance values

Class I, Div. 1, Group A,B Class I, Zone 1, Group IIC		Class I, Div. 1, Group C-G Class I, Zone 1, Group IIB	
L_o, L_a [mH]	C_o, C_a [nF]	L_o, L_a [mH]	C_o, C_a [nF]
		10.0	320
		5.0	320
2.0	47	2.0	340
1.0	62	1.0	400
0.5	79	0.5	490
≤ 0.2	94	0.2	630
		≤ 0.1	747

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			2004	Date	Name	Certification drawing **Digital Output Module Type 9475** **(continued from sheet 9)**	Scale: none
			Drawn by	April	Toby		Sheet: 10 of 14
			Checked		Faulring		
B	17.08.09	Einsiedler	STAHL			94 006 01 31 2	Agency: CSA
A	10 / 2004	T. Stahl					
Index	Date	Name				Rep. f. / Rep. t.	A4

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